

The earliest salt production in the world: an early Neolithic exploitation in *Poiana Slatinei-Lunca, Romania*

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In Europe, salt exploitation during the Iron Age has been a subject for many studies, based on the earthenware remains called briquetages. In the last few years, studies on the pre- and protohistoric origin and development of this type of production have increased throughout Europe (Weller (ed.) 2002). The use of fire is central to this type of production. It enables the brine to evaporate and crystallize into hard and transportable salt cakes, moulded in pottery containers. The first briquetages appear in the mid-fifth millennium BC in central and eastern Europe (Weller 2002a). Should we therefore assume that briquetages are the earliest salt exploitations in Europe? It does not seem so if we consider the research carried out for more than 20 years by the History and Archaeology Museum of Piatra Neamt (Romania) (Dumitroaia 1987, Monah 1991), as well as by the Chrono-Ecology Laboratory (UMR 6565, CNRS) in eastern France (Pétrequin *et al.* 2001) and by others in Catalonia (Weller 2002b). As a result of the meeting of these two teams during a research program on the salt springs of Romanian Moldavia, we can present here the latest results from the most ancient salt exploitation site in Europe, and probably in the world.

Figure 1. 1. Location of the *Poiana Slatinei* site (Lunca, Vânatori-Neamt)

Figure 2. Salt spring (foreground) and *Poiana Slatinei* prehistoric exploitation site (photo by O. Weller)

A unique site in the north east of Romania

In 1984, the Romanian team of the Museum of Piatra Neamt brought to light the earliest evidence for European salt exploitation at the *Poiana Slatinei* site in Lunca, Vânatori-Neamt (Figure 1) (Dumitroaia 1994). This site is unique in Europe for the preservation of its 60

metres long by 25 metres wide stratified midden of ash, charcoal and red coloured burnt soil (Figure 2). Located in the vicinity of a still-used salt spring, it contains large amounts of combustion soils. The succession of combustion and feruse areas have formed a sizeable mound almost 3 metres high. This exploitation was facilitated by the strong natural concentration of this salt spring: 160 g/l, i.e. six more times than the sea water. Painted ware from the different trenches (Starcevo-Cris culture IIIb-IVa) (Dumitroaia 1994) shows that most of this deposit can be dated to the Early Neolithic. The examination of this deposit, carried out by G. Dumitroaia, has also revealed Precucuteni, Komarov-Costisa, Noua and Hallstadian exploitations.

Research in 2004

In 2004, the S1.02 sondage, opened in 2002 on top of the deposit, was extended in order to analyse samples (soils, charcoals, pollen) and carry out detailed and systematic recording (Figures 3 and 4). The Franco-Romanian team conducted the 2004 excavation and extended it to 20m². In doing so, they revealed the base of the deposit unreached in 2002 because of a significant rise in the water table to a depth of 3.5m. A 5.25m deep, wood-lined shaft for salted water was discovered. This was filled with a combustion midden containing some Starcevo-Cris decorated ware. Although no finds of this period were recorded, the two corresponding C14 AMS dates (710-900 AD) seemed to prove this well was medieval. The well, whose opening is no longer preserved, was in fact dug through the neolithic layers and then back-filled in medieval times.

The Bronze Age exploitations also left a series of well-stratified fireplaces on the eastern part of the deposit, over 0.70m high (Trench S XI). Both C14 dates, carried out on two fireplaces 0.40m apart, suggest a short period of exploitation (between 1750 and 1630 BC) (Figure 5).

Figure 3. *Poiana Slatinei* site map (based on Dumitroaia 1994). Click to enlarge.

Figure 4. Section north of the S1.02 and stratigraphic details (Fire pits and combustion levels) (photos by O. Weller)

The earliest exploitations dated by C14

We now have nine C14 AMS dates available. They have been produced by the same laboratory (Poznan Radiocarbon Laboratory, Poland) on the earliest and best preserved part of the deposit. These calibrated dates are consistent and confirm the early date for European salt exploitation at the end of the seventh millennium BC (Figure 6). Clearly, that the first salt exploitation emerged in Eastern Europe during the earliest Neolithic (6050-5500 BC).

Production intensity and uses of this crystallised salt for these early Neolithic communities of eastern Europe have yet to be determined. Was it only intended to be used for food? To preserve it ? For the herds' needs? Or can we already see, in this early production, a desire to produce and exchange a rare status-enhancing substance?

Figure 5. List of the calibrated dates for S XI (Bronze Age). Click to enlarge.

Figure 6. List of the calibrated dates with 1 and 2 sigmas apart from S1.02 (Early Neolithic). Click to enlarge.

Perspectives

During five centuries, the successive exploitation has formed an accumulation of combustion soils of over 2 metres. Chemical and micro-morphological analyses should provide essential evidence for the interpretation of these tens and even hundreds of Neolithic fireplaces. These analyses, together with the work on micro-fossils and charcoal, are being carried out as part of the joint research program. The ultimate goals are to identify the range of techniques employed, to examine how the resource was managed, to study the interactions with the natural environment, and finally to assess the socio-economic impact of this first European salt production.

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